

**Trova il quoziente tra i due polinomi:**

$$(x^3 + 2x^2 - x - 2) : (x + 2) \quad [x^2 - 1]$$

$$(x^3 - x^2 - 4x - 6) : (x - 3) \quad [x^2 + 2x + 2]$$

$$(3x^5 - 9x - 7x^3 + 24) : (2 + x) \quad [3x^4 - 6x^3 + 5x^2 - 10x + 11; R = -14]$$

$$(2x^2 + x^3 - x + 9) : (x + 3) \quad [x^2 - x + 2; R = 3]$$

$$(2x^3 + 10x^2 + 12x - 2) : (2x + 4) \quad [x^2 + 3x; R = -2]$$

$$(3x^5 - 6x^4 - x^3 + 5x^2 - 1) : (3x^2 - 1) \quad [x^3 - 2x^2 + 1]$$

$$(-3y^3 + 2y^4 - 9y^2 - 5) : (y - 3) \quad [2y^3 + 3y^2; R = -5]$$

$$(x^4 + x^3 - 3x^2 + 7x - 4) : (x^2 - x + 2) \quad [x^2 + 2x - 3; R = +2]$$

$$(x^5 - 2x^4 + 2x^3 - 2x^2 + 3x) : (x^2 - x) \quad [x^3 - x^2 + x - 1; R = 2x]$$

$$(6a^3 - 19a + 18a^2 + 21) : (4 + a) \quad [6a^2 - 6a + 4; R = 1]$$

$$(x^5 - 4x^4 + 4x^3 - 3x + 2) : (x^2 - 3x + 1) \quad [x^3 - x^2 + 1; R = 1]$$

$$(4x^3 - 11x^2 + 5x + 3) : (x - 2) \quad [4x^2 - 3x - 1; R = 1]$$

**Esegui le divisioni rispetto alla variabile di riferimento indicata:**

$$(5a^3b - 2a^2y^2 - ay^3) : (a^2 - b^2) \quad a \quad [5ay - 2y^2; R = 4ay^3]$$

$$(a^4b^2 - 4 + 2ab^3) : (a^2b + 2) \quad a \quad [a^2b - 2; R = 2ab^3]$$

$$(8a^3 - 27b^3 + 2ab^2) : (4a^2 + 6ab + 9b^2) \quad a \quad [2a - 3b; R = 2ab^2]$$

$$(3x^4y + 2x^3 + x^2y^2 + y) : (3x^2 + y) \quad x \quad \left[ x^2y + \frac{2}{3}x; R = -\frac{2}{3}xy + y \right]$$

$$(-3x^2y^2 - 6y^4 - 2x^3y - 2xy^3 + 3x^4) : (-6y^2 + 3x^2 - 2xy) \quad x \quad [x^2 + y^2]$$

**Scrivi ognuno dei polinomi seguenti come somma o differenza di due potenze e individua alcuni dei suoi divisori:**

$x^5 + 32$	$x^6 - y^3$	$32a^5 + c^5$	$x^8y^8 - z^8$
$x^7 + a^7$	$x^2y^2 - 4$	$\frac{1}{4}x^2y^2 - 9$	$\frac{a^3}{27} - 8b^6$
$x^2y^4 - 9$	$a^3b^6 + 1$	$4x^{2n} - y^{2n-4}$	$n > 2, n \in \mathbb{N}$

**Fattorizzazioni:**

$12x^3 - 4x^2 - 5x + 2$

$[(2x - 1)^2(3x + 2)]$

$x^3 - 3x^2 - 4x + 12$

$[(x - 3)(x + 2)(x - 2)]$

$3x^3 + x^2 + 3x + 1$

$[(x^2 + 1)(3x + 1)]$

$2a^3 - a^2 - 2a + 1$

$[(1 - a)(1 + a)(1 - 2a)]$

$y^3 - y^2 - 4y + 4$

$[(y - 1)(y + 2)(y - 2)]$

$z^3 - 12z^2 + 21z - 10$

$[(z - 1)^2(z - 10)]$

$2x^5 - x^4 + 6x^3 - 3x^2 + 4x - 2$

$[(x^2 + 1)(x^2 + 2)(2x - 1)]$

$x^4 + 5x^3 - 5x^2 - 45x - 36$

$[(x + 1)(x + 4)(x + 3)(x - 3)]$

$z^4 - 6z^3 + 9z^2 - 6z + 8$

$[(z - 2)(z - 4)(z^2 + 1)]$

$4x^3 - 8x^2 - 11x - 3$

$[(x - 3)(2x + 1)^2]$

$9a^3 + 18a^2 - a - 2$

$[(a + 2)(3a + 1)(3a - 1)]$

$2a^2b + 2ab^2 - 2abc - 2b^2c$

$[2b(a + b)(a - c)]$

$a^3b^2 + a^2b^3 + a^2b^2 + ab^3$

$[ab^2(a + b)(a + 1)]$

$5xy^2 + 5y^3 - 5zy^2 - 5xyz$

$[5y(x + y)(y - z)]$

$2x + y + 2ax + 4bx + ay + 2by$

$[(2x + y)(1 + a + 2b)]$

$y + 1 + x^2y^2 - x^2 + y^2 - 1$

$[(y + 1)(x^2y - x^2 + y)]$

$x^2y^2 - x^2 - y^2 + 1$

$[(y - 1)(y + 1)(x + 1)(x - 1)]$

$x^4 - 2x^3 - 5x^2 + 6x$

$[x(x - 3)(x + 2)(x - 1)]$

$a^2 + a - b^2 + \frac{1}{4}$

$\left[ \left( a + \frac{1}{2} + b \right) \left( a + \frac{1}{2} - b \right) \right]$

$x^6 - y^6 + x^3 - y^3$

$[(x - y)(x^2 + xy + y^2)(x^3 + y^3 + 1)]$

$x^6 - y^6 + x^3 + y^3$

$[(x + y)(x^2 - xy + y^2)(x^3 - y^3 + 1)]$

$x^4 - y^4 - 2xy(x^2 - y^2)$

$[(x + y)(x - y)^3]$

$x^5y^5 - x^3y^3 - 27x^2y^2 + 27$

$[(xy + 1)(xy - 1)(xy - 3)(x^2y^2 + 3xy + 9)]$

$a^2x^3 - 4x^3 - 8a^2 + 32$

$[(a + 2)(a - 2)(x - 2)(x^2 + 2x + 4)]$

$9 + a^2x^3 - 9x^3 - a^2$

$[(a + 3)(a - 3)(x - 1)(x^2 + x + 1)]$

$0,01 \cdot x^2 - 0,06 \cdot xy + 0,09 \cdot y^2$

$[0,01 \cdot (x - 3y)^2]$

$16a^2 - 8ab + b^2 - 4ac + bc$

$[(b - 4a)(b - 4a + c)]$

$-ax^4 - a^4x$

$[-ax(x + a)(x^2 - ax + a^2)]$

$a^7 - 16a^3b^4$

$[a^3(a^2 + 4b^2)(a + 2b)(a - 2b)]$

$9a^3 - a^7$

$[a^3(3 + a^2)(3 - a^2)]$

$a^3x^3 + 8 - a^3 - 8x^3$

$[(x - 1)(x^2 + x + 1)(a - 2)(a^2 + 2a + 4)]$

$2a^3 + 2ab^2 + 2ac^2 + 4a^2b + 4a^2c + 4abc - a^2 - ab - ac$

$[a(a + b + c)(2a + 2b + 2c - 1)]$

**Frazioni algebriche:**

$$\left(\frac{x+1}{x-1} + \frac{x-1}{x+1} + \frac{4x}{1-x^2}\right) \left(1 + \frac{2x}{1-x}\right) \quad [-2]$$

$$\left(x-y + \frac{xy}{x+y}\right) \left(x+y - \frac{xy}{x-y}\right) \frac{xy+y^2}{(x^2+y^2)^2 - 5x^2y^2} \quad \left[\frac{y}{x-y}\right]$$

$$\left(\frac{x^3+x^2y+xy^2}{y^3-x^3} + \frac{x+y}{x-y}\right) \frac{x^2-y^2}{xy} + \frac{y+x}{y} \quad \left[\frac{(x+y)^2}{xy}\right]$$

$$\left(\frac{ab-ay+bx-xy}{a-x} + \frac{bx+by-xy-y^2}{x-a}\right) : \frac{ax-ay}{ab-ay-bx+xy} \quad \left[\frac{(b-y)^2(y-a)}{a(x-y)}\right]$$

$$\left[\left(1 + \frac{1}{a} + \frac{1}{a^2}\right) : \left(1 - \frac{1}{a^3}\right)\right] : \left(\frac{2}{a-1} - \frac{4}{a-2}\right) + \frac{(a-1)^2-1}{2a} \quad [0]$$

$$\left(\frac{3x+1}{x+y} \cdot \frac{x^2-y^2}{9x^2-1} + \frac{3x-1}{x-y} \cdot \frac{x^2-y^2}{9x^2-1}\right) : \frac{3x^2-y}{3x+1} + \frac{2}{3x+1} \quad \left[\frac{12x}{9x^2-1}\right]$$

$$\frac{5}{4} \left(\frac{5a^2+3a-2}{25a-10} + \frac{a^2}{2-5a}\right) \left(\frac{1}{3a-2} - \frac{1}{3a+2}\right) : \frac{1}{5a^2-2a} \quad \left[\frac{a}{3a+2}\right]$$

$$\frac{8x^2+8x}{3x-3} : \left(\frac{3x}{2x-2} + \frac{2x}{3x+3} - \frac{x^2-7x}{6x^2-6}\right) \quad \left[\frac{4}{3}(x+1)\right]$$

$$\left[\left(\frac{1}{x^3y} + \frac{y}{x^2} + \frac{1}{xy^2}\right) : \frac{y(1+2xy^2)-x(y^3-x)}{x^2y^2}\right] : \left(1 - \frac{1}{x}\right) \quad \left[\frac{1}{x-1}\right]$$

$$\left[\left(1 + \frac{1}{a}\right) : \frac{1}{a}\right] \left[\left(a-1 + \frac{1}{a}\right) : \frac{1}{a}\right] : \left[\left(a^2 + \frac{1}{a}\right)(-a)\right] \quad [-1]$$

$$\left[\left(a+1 + \frac{1}{a-1}\right) : \left(a-1 + \frac{1}{a+1}\right) - \frac{a-1}{a+1}\right] : \left(\frac{1}{a+1} + \frac{1}{a-1}\right) \quad [2]$$

$$\left[\left(1 - \frac{m}{m+n}\right) : \left(1 - \frac{n}{m+n}\right)\right]^2 : \left[\left(1 - \frac{1}{m}\right)\left(1 + \frac{1}{m}\right)\right] + \frac{1}{1-m^2} \quad \left[\frac{n^2-1}{m^2-1}\right]$$

$$\left[\left(a + \frac{1}{a+1}\right)^2 + \left(a - \frac{1}{a+1}\right)^2 - \frac{2}{(a+1)^2}\right] : \left(\frac{1}{a^3} + \frac{1}{a^2}\right) \quad \left[\frac{2(1+a)}{a}\right]$$

$$\frac{x^2+ax+a^2}{x^2-a^2} \cdot \frac{\left(1 - \frac{a}{x}\right)^2 \cdot \left(1 + \frac{a}{x}\right)^2}{x^3-a^3} \quad \left[\frac{x+a}{x^4}\right]$$

$$\left[\left(\frac{2a+1}{a-3}\right) \cdot \left(\frac{a+3}{3a-1}\right)^{-1} - \frac{2a}{1+a}\right] : \left(\frac{2a-1}{a+3} - \frac{14}{a^2+4a+3} - \frac{2a-5}{a+1}\right) \quad [\text{impossibile}]$$

$$\left(\frac{a+b}{a^2-b^2} : \frac{a^3-b^3}{b-a}\right) : \frac{b-a}{a+b} \quad \left[\frac{a+b}{a-b}\right]$$

$$\frac{\left(\frac{a}{b} - \frac{b}{a}\right) : \left(\frac{1}{b} + \frac{1}{a}\right)}{\left(\frac{a^2}{b^2} - \frac{b^2}{a^2}\right) : \left(\frac{1}{b^2} + \frac{1}{a^2}\right)} : \left(1 - \frac{2b}{a+b}\right) \quad \left[\frac{1}{a-b}\right]$$

$$\left(\frac{a + \frac{b^2}{a-b}}{b + \frac{a^2}{a+b}} : \frac{a + \frac{b^2}{a-b}}{a+b}\right) \frac{a^3-b^3}{a+b} + \frac{1 - \left(\frac{a}{b}\right)^2}{\left(\frac{1}{b}\right)^2} \quad [0]$$